The effect of plant-based dietary patterns on blood pressure

Food Encounters: A Network Conference

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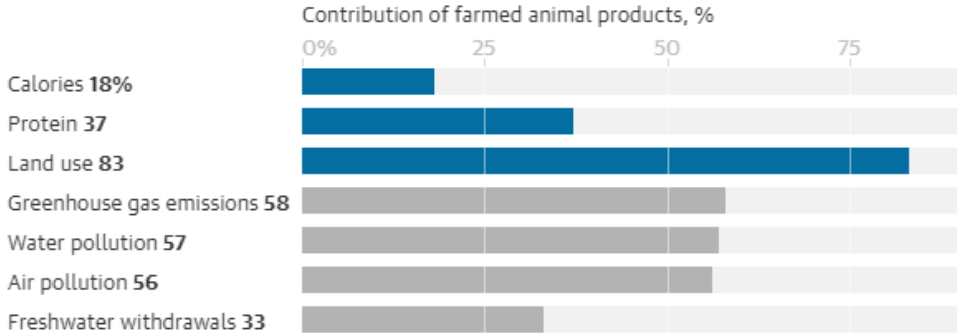
Background

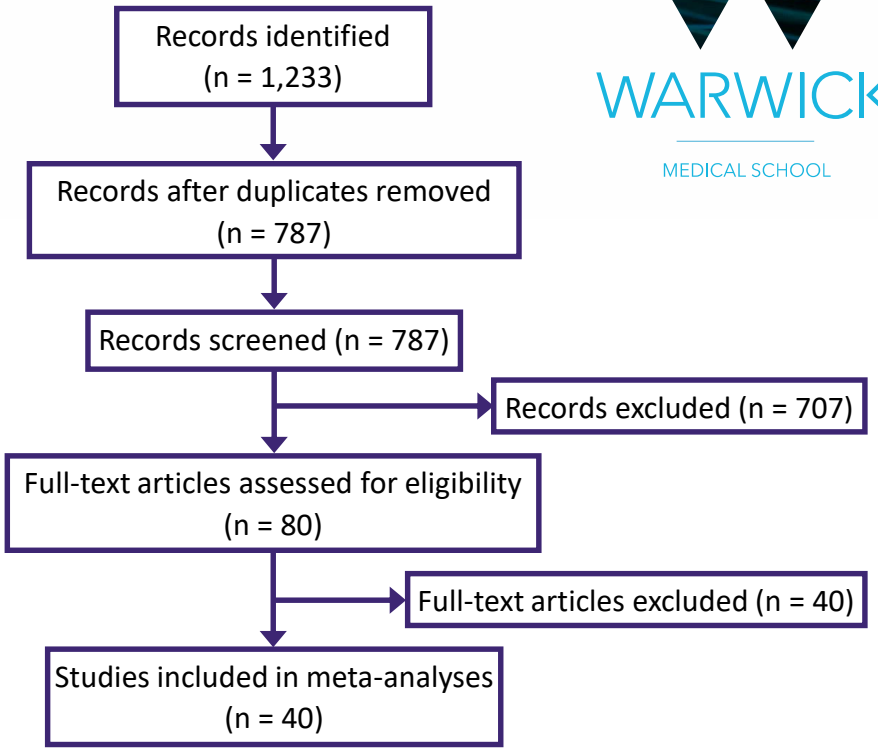
- **GHG emissions** must be **halved** from their 2010 levels **by 2030** to avoid reaching 1.5°C above pre-industrial temperatures[1]
- **Livestock** sector is accountable for **~18% of GHG emission**[2]
- What are the health impacts of plant-based diets?



Source: Poore & Nemecek, 2018.[6]

Methods

- **Database search**
- **Title/abstract screening**
- **Full-text review**
- **Data extraction**
- **Quality assessment**
- **Pool data**



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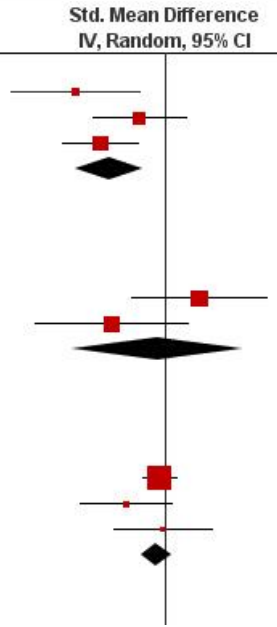
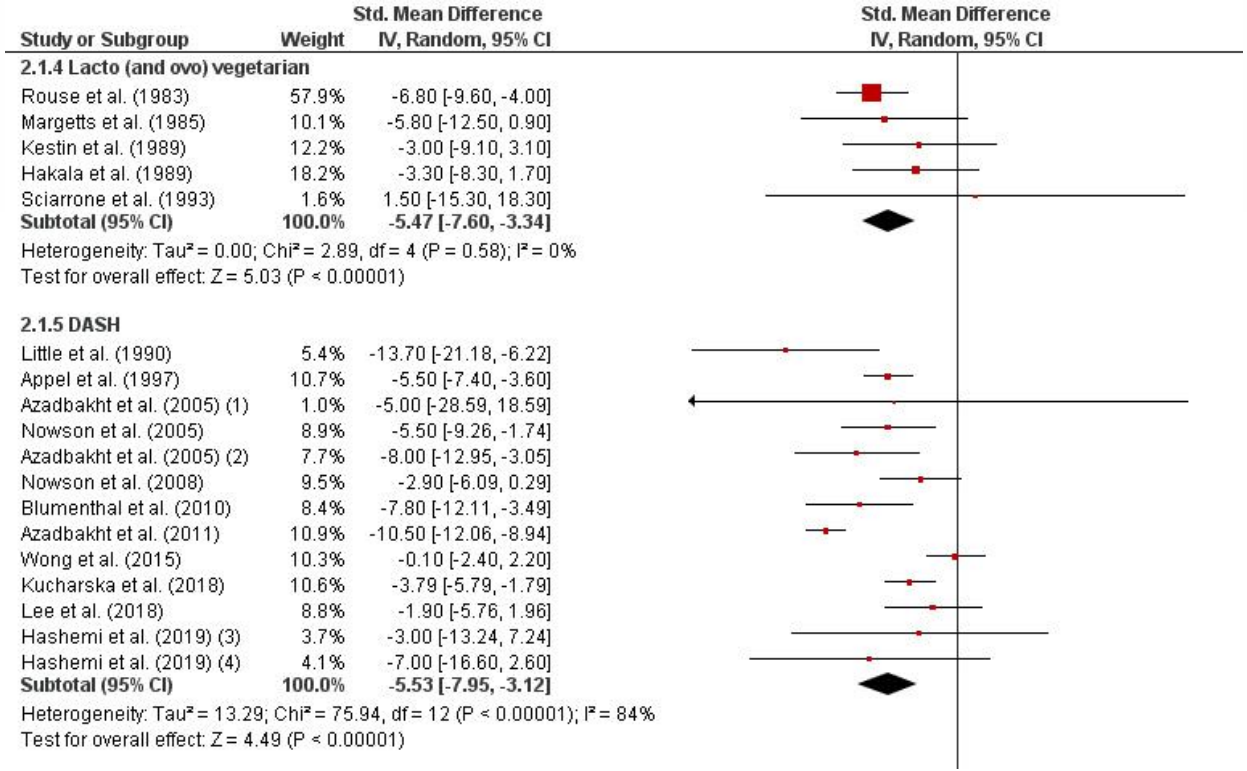
Results

Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
2.1.1 Healthy Nordic		
Adamsson et al. (2011)	21.0%	-7.15 [-12.34, -1.96]
Uusitupa et al. (2013)	34.6%	-2.00 [-5.70, 1.70]
Poulsen et al. (2014)	44.4%	-5.13 [-8.16, -2.10]
Subtotal (95% CI)	**100.0%**	**-4.47 [-7.14, -1.81]**
Heterogeneity: Tau² = 1.78; Chi² = 2.92, df = 2 (P = 0.23); I² = 31%		
Test for overall effect: Z = 3.29 (P = 0.001)		
2.1.2 High Fruit & Vegetables		
Broekmans et al (2001)	52.1%	2.80 [-2.60, 8.20]
Noad et al. (2016)	47.9%	-4.23 [-10.33, 1.87]
Subtotal (95% CI)	**100.0%**	**-0.57 [-7.45, 6.32]**
Heterogeneity: Tau² = 16.07; Chi² = 2.86, df = 1 (P = 0.09); I² = 65%		
Test for overall effect: Z = 0.16 (P = 0.87)		
2.1.3 High Fiber		
Fehily et al. (1986)	80.9%	-0.40 [-1.71, 0.91]
Morenga et al. (2011)	10.1%	-3.10 [-6.80, 0.60]
Brooking et al. (2012)	8.9%	-0.11 [-4.06, 3.84]
Subtotal (95% CI)	**100.0%**	**-0.65 [-1.83, 0.53]**
Heterogeneity: Tau² = 0.00; Chi² = 1.90, df = 2 (P = 0.39); I² = 0%		
Test for overall effect: Z = 1.08 (P = 0.28)		





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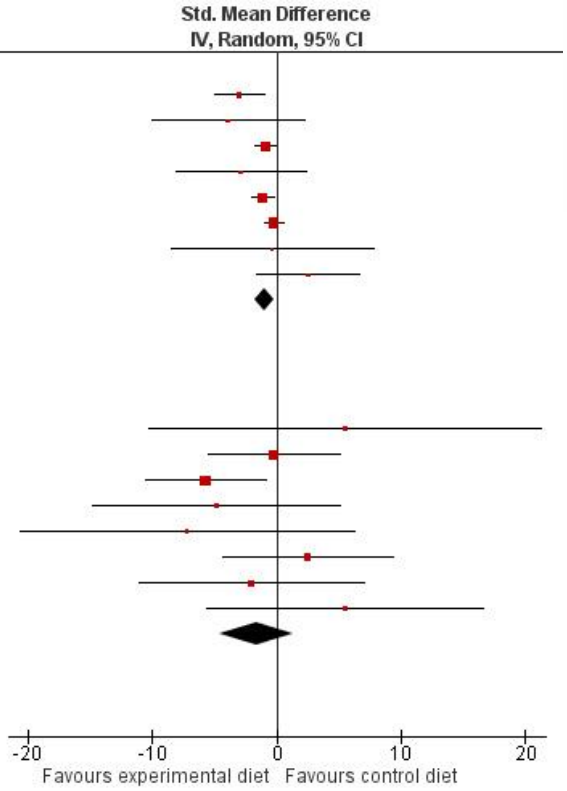
Study or Subgroup	Weight	Std. Mean Difference IV, Random, 95% CI
2.1.6 Mediterranean		
Esposito et al. (2004)	10.6%	-3.00 [-5.00, -1.00]
Rallidis et al. (2009)	1.5%	-3.90 [-10.05, 2.25]
Toledo et al. (2013)	27.1%	-0.90 [-1.77, -0.03]
Lee et al. (2015)	2.0%	-2.86 [-8.07, 2.35]
Davis et al. (2017)	26.4%	-1.10 [-2.00, -0.20]
Wade et al. (2018)	28.5%	-0.20 [-1.01, 0.61]
Mayr et al. (2019)	0.8%	-0.30 [-8.43, 7.83]
Wade et al. (2019)	3.0%	2.53 [-1.63, 6.69]
Subtotal (95% CI)	**100.0%**	**-0.95 [-1.70, -0.20]**
Heterogeneity: Tau² = 0.35; Chi² = 11.28, df = 7 (P = 0.13); I² = 38%		
Test for overall effect: Z = 2.47 (P = 0.01)		
2.1.7 Vegan		
Nicholson et al (1999)	3.4%	5.50 [-10.20, 21.20]
Barnard et al. (2006)	24.2%	-0.20 [-5.50, 5.10]
Ferdowsian et al. (2010)	27.8%	-5.70 [-10.55, -0.85]
Macknin et al. (2015)	8.1%	-4.82 [-14.74, 5.10]
Bunner et al (2015)	4.6%	-7.20 [-20.60, 6.20]
Lee et al. (2016)	15.7%	2.50 [-4.38, 9.38]
Wright et al. (2017)	9.7%	-2.00 [-11.00, 7.00]
Barnard et al. (2018)	6.6%	5.50 [-5.60, 16.60]
Subtotal (95% CI)	**100.0%**	**-1.61 [-4.53, 1.31]**
Heterogeneity: Tau² = 1.88; Chi² = 7.81, df = 7 (P = 0.35); I² = 10%		
Test for overall effect: Z = 1.08 (P = 0.28)		



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Conclusion

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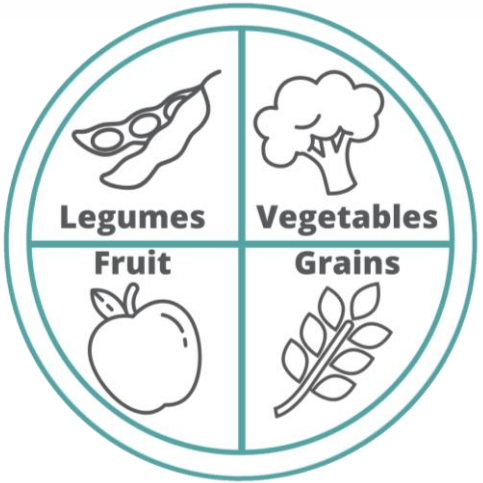
- A **5 mm Hg reduction** in systolic BP is estimated to **reduce the prevalence of hypertension by 50%**[3]
- Save **£850 million** in NHS and social care spend over a ten-year period[4]
- Supports pledge for plant-based food system



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2. Stehfest E, Bouwman L, Van Vuuren DP, Den Elzen MG, Eickhout B, Kabat P. Climate benefits of changing diet. Climatic change. 2009;95(1-2):83-102.
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4. McPherson K, Britton A, Causer L, editors. Coronary heart disease: estimating the impact of changes in risk factors2002: Stationery Office National Heart Forum.
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